

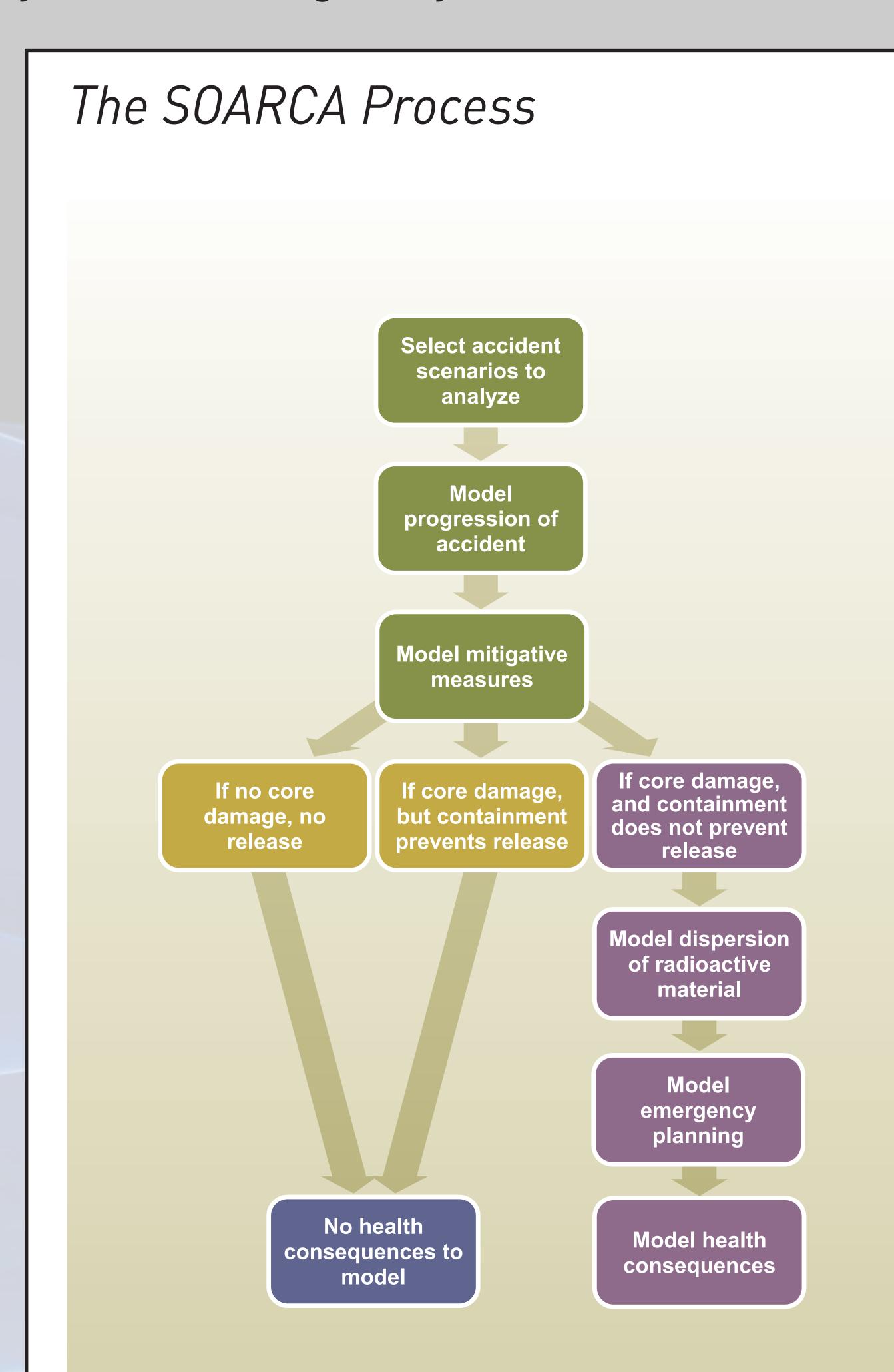
# Office of Nuclear State-of-the-Art Reactor Consequence Analyses (SOARCA)

### What is SOARCA?

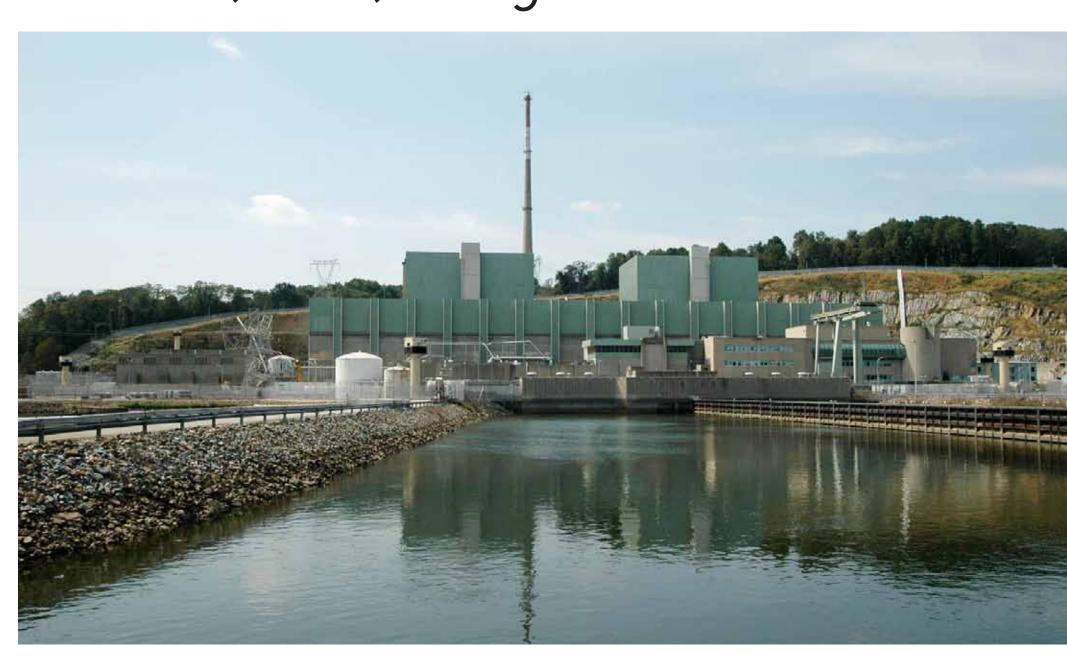
 SOARCA was a major research project conducted by NRC and its contractors to develop best estimates of the offsite radiological health consequences for severe reactor accidents at two plants, **Peach Bottom and Surry** 

## What were its objectives?

- To update the quantification of severe accident consequence studies, particularly the 1982 Siting Study (NUREG/CR-2239)
- To incorporate plant changes not reflected in earlier assessments
- To evaluate potential benefits of security-related improvements (10 CFR 50.54(hh))
- To incorporate state-of-the-art modeling with the MELCOR and MACCS2 computer codes
- To better enable NRC to communicate severe accidentrelated aspects of nuclear safety to diverse stakeholders



The Peach Bottom Atomic Power Station (left) is a General Electric boiling water reactor (BWR) design with a Mark I containment and is located in Delta, PA.



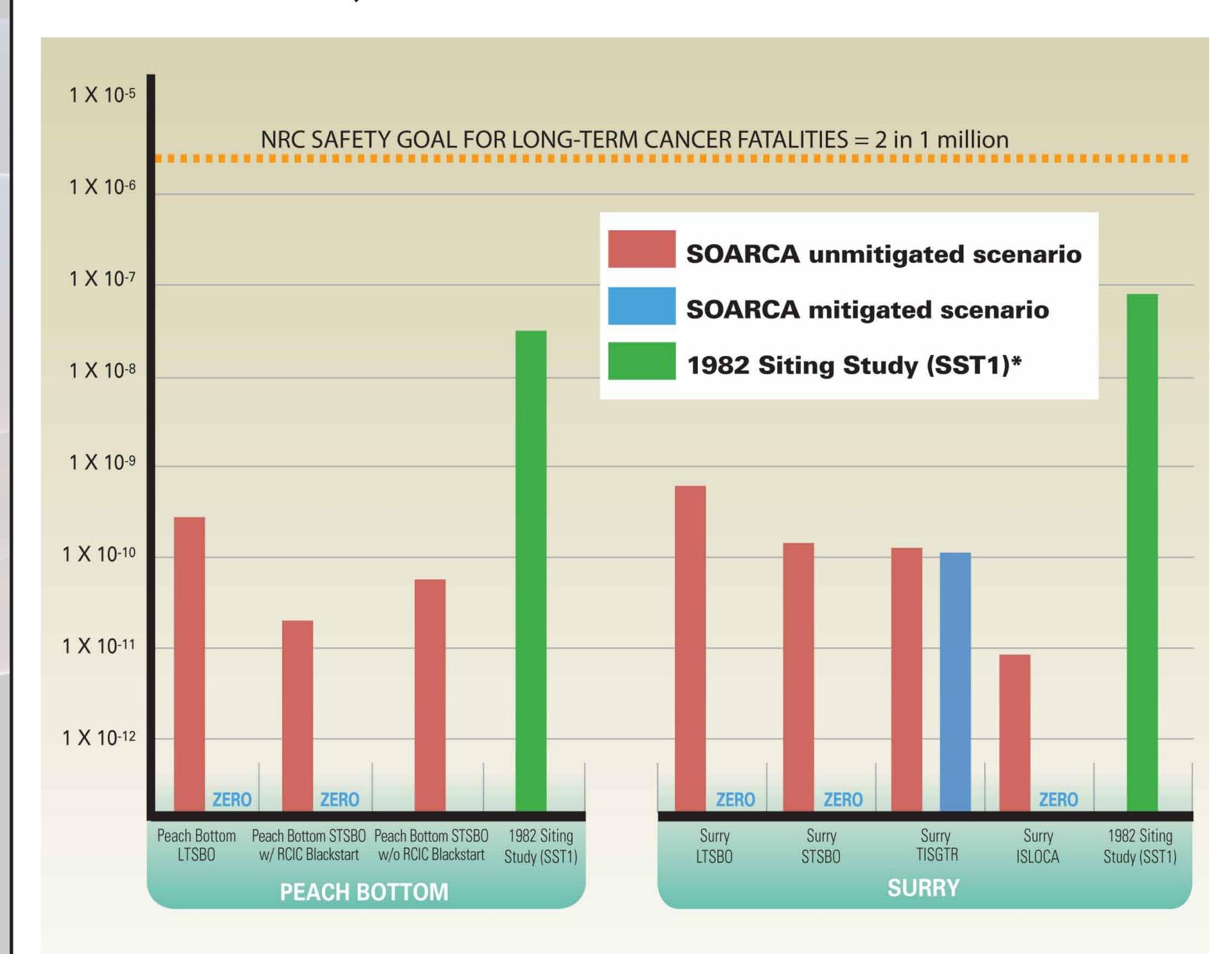


The Surry Power Station (right) is a Westinghouse pressurized water reactor (PWR) design with a large, dry subatmospheric containment and is located in Surry, VA.

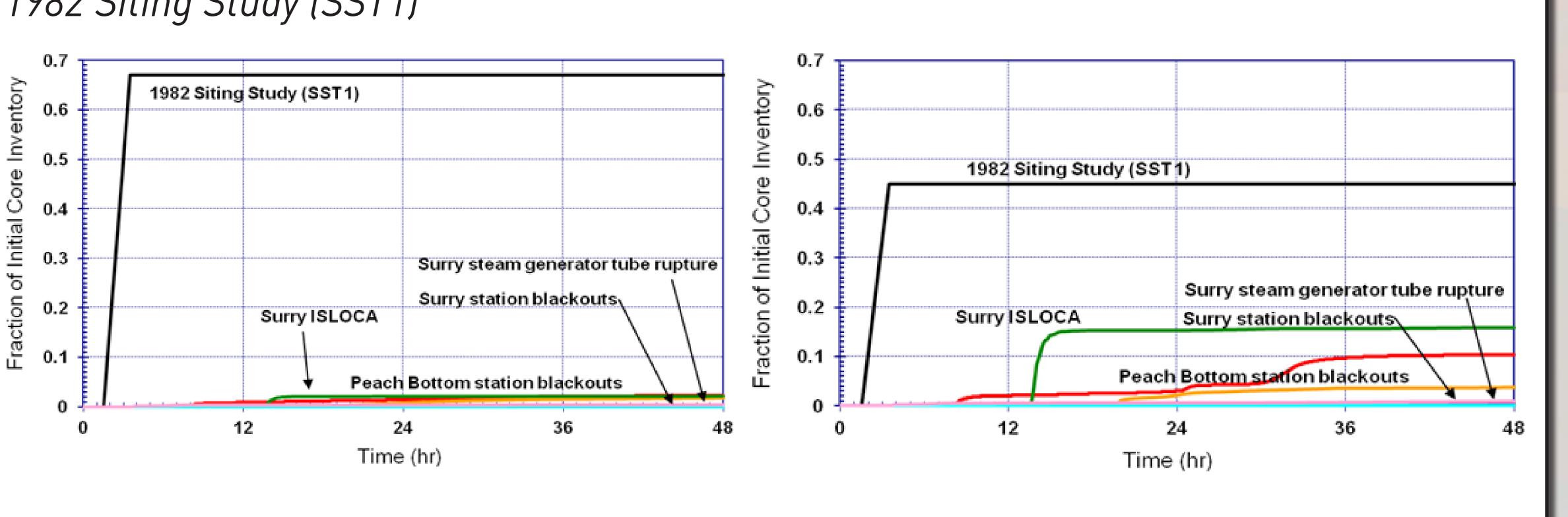
## What were the project's results?

- Existing resources and procedures, when effectively implemented, can stop an accident, slow it down, or reduce its impact before it can affect public health
- Even if accidents proceed without effective intervention, they take much longer to happen and release much less radioactive material than earlier analyses suggested
- The analyzed accidents would cause essentially zero immediate deaths and only a very, very small increase in an individual's risk of a long-term cancer death relative to the average annual risk of cancer death for an individual in the U.S. from all causes

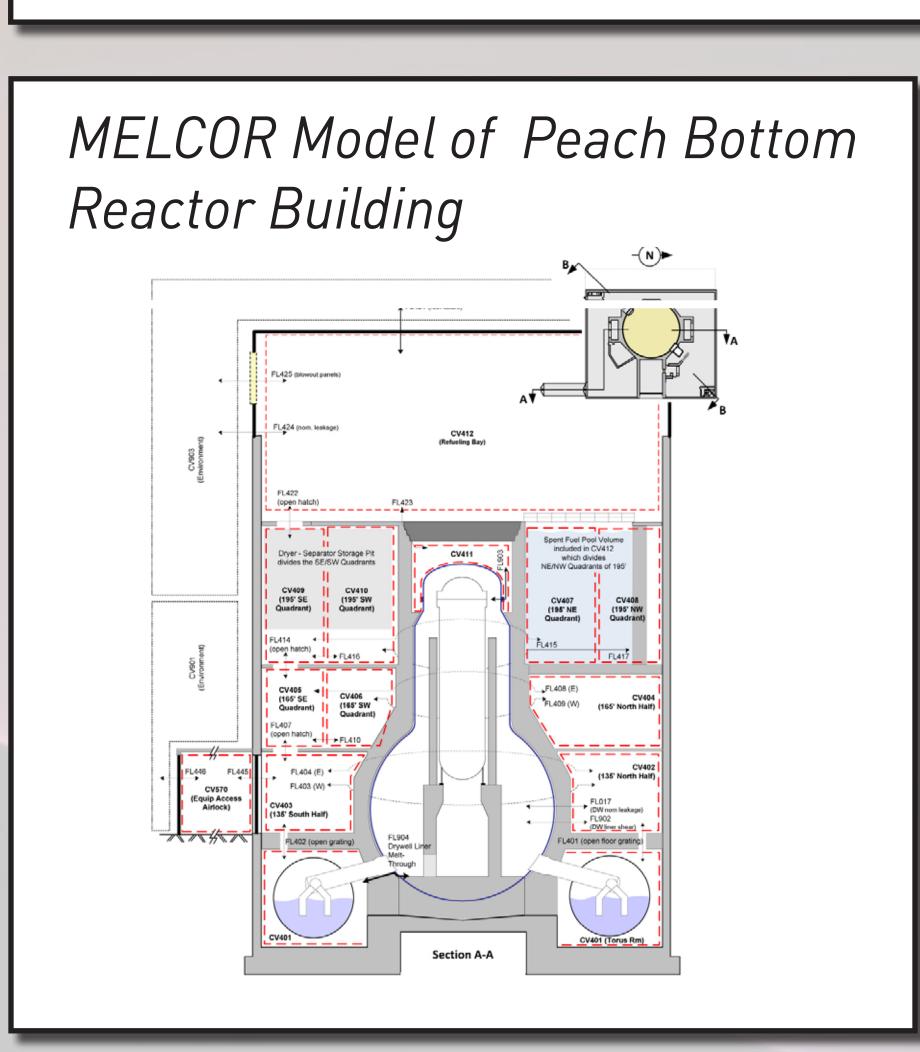
Scenario-Specific Risk of Latent Cancer Fatality for an Individual within 10 miles Assuming Linear-No Threshold Dose Response Model (per Reactor-Year)



Cesium (left) and Iodine (right) Release for SOARCA Unmitigated Scenarios and 1982 Siting Study (SST1)



Scenarios Analyzed in SOARCA



Reactor Site	Accident Scenario	Description
Peach Bottom & Surry	Long-Term Station Blackout (LTSBO)	Seismic event; loss of ac power; batteries available initially
Peach Bottom & Surry	Short-Term Station Blackout (STSBO)	Seismic event; loss of ac power; batteries unavailable
Surry	STSBO with Thermally Induced Steam Generator Tube Rupture (TISGTR)	Variation of STSBO – a steam generator tube ruptures resulting in a pathway for radioactive material to potentially escape
Surry	Interfacing Systems Loss-of-Coolant	Random failure of valves ruptures low-pressure system piping

Accident (ISLOCA)



outside containment